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This issue of the *Gazette* features a long article by society member Mitsue Ikeda on Japanese magic lanterns. Members who have attended our recent conventions will be familiar with her shows that recreate 19th century magic lantern shows using distinctively Japanese wooden magic lanterns, with rear-screen projection, moving images, music, and narration. She begins with a comprehensive history of this style of magic lantern show. Her research has shown that shortly after the introduction of European style magic lanterns to Japan by Dutch traders, Japanese artisans began their own style of lantern. She also found that wooden magic lanterns were in use in western Japan by the late 18th century, several decades earlier than previously thought.

The article goes on to explore technical details of lantern construction, including characteristics of the type of wood used and its unique properties making it ideally suited for hand-held magic lanterns. The various types of Japanese lantern slides are explored in detail, including motion slides, as are methods used to make the slides in the 19th century and for modern reproductions of early slides. The article also discusses source materials for early lantern show scripts, including Japanese dramas and stories. Finally, Mitsue relates her own experience in forming a performing group to bring early Japanese magic lantern shows back to life.

This issue concludes with a short Research Page, which includes a summary of a recent article on Japanese magic lanterns by a British scholar who recently completed a Ph.D. dissertation on the subject at the University of Oxford. There also is a summary of an article on a strange rain-making episode in the life of lantern showman John Henry Pepper.

As always, I am eager to receive additional material for the Winter 2019 issue and subsequent issues of the *Gazette*.

Japanese chromatropes. Photo by Mitsue Ikeda.

For more on Japanese magic lantern shows, see our society webpage:

http://www.magiclanternsociety.org/about-magic-lanterns/the-magic-lantern-in-japan/

Kentwood D. Wells, Editor
451 Middle Turnpike
Storrs, CT 06268
kentwood.wells@uconn.edu
860-429-7458

Nishiki Kage-e (Japanese Magic Lantern): Characteristics and Establishment of Its Performing Space

Mitsue Ikeda

Director, Nishiki Kage-e Ikeda-Gumi
mi3tsu2-0121e@rouge.plala.or.jp

Translated by

Dr. Yuki Tanaka-McFarlane

This paper discusses the characteristics and establishment of the performing space of *Nishiki Kage-e*[1] (Japanese magic lantern) derived from the author's practical engagement in its reconstruction and performance. Nishiki kage-e and magic lantern performance in the *Edo* Period (1603-1868)[2] are considered to be the origin of Japanese animation. The defining characteristic of this performing art is the intimate connection between a performer's physical movements and the projected images.

At the end of the 18th century, corresponding to the *Meiwa* period (1764–1772) in the Japanese calendar system, a metallic magic lantern of the West was introduced to Japan through the Dutch. Japanese lantern performers at the time replaced the metal of the Dutch magic lanterns with *kiri* (*Paulownia* wood), a wood that is light and resistant to heat.[3] Replacing the lantern's heavy metal body with light wood enabled performers to easily carry the lantern and move both their bodies and the device freely to project the images. The Japanese lantern performers also made many improvements and adjustments to various parts of the lantern. Those changes include a shutter screen in front of the lens, adjustments to the lens operation system, changes in projection distance, the ability to superimpose images by using multiple wooden magic lanterns (hereinafter called *furo*; Fig. 1), and devising original projection methods and hand operation techniques.[4] The basic operation consists of a glass slide (*tane-ita*; Fig. 2) inserted into a *furo*, with the slide able to move inside the furo. The projected image makes various movements on a wide screen made of horizontally spliced hand-made Japanese paper.

Like Western phantasmagoria, a Japanese magic lantern projects the image from the back of the screen using multiple projecting devices (furos). However, unlike the Western version, a Japanese magic lantern does not need a dolly to move because of the mobility of the handheld furos. The performers operate furos along with musical instruments and narration. The latest dyeing technology available at the time was used for painting tane-ita. The images were painted with light transmissive dyes while the rest of the tane-ita was blacked out with *sumi* (ink sticks) so that the colored images stood out in the dark. This moving projection with vivid colors fascinated people and became a precursor of Japanese motion picture and image culture. The popularity of the Japanese magic lantern was depicted in several ukiyo-e art prints (Okubo 2011: 70-71). For example, an *uchiwa-e*[5] titled "*Utsushi-e Kenbutsu* (Viewing a Magic Lantern Performance)" (1832) by Kuniyoshi Utagawa, a ukiyo-e artist of the Edo period, depicts a scene where women and children watch the screen that shows a *Daruma* doll,[6] with hands and legs that spring out from its body, dancing around a *Fukusuke* doll,[7] who is giving a speech (Okubo 2011: 70-71). An illustration

Fig. 1. An example of a furo (Japanese wooden magic lantern). Photo by Mitsue Ikeda, December 13, 2011.

Fig. 2. An example of tane-itas (lantern slides). These slides are used for an original play, "*Sakura Shiranami Hyoi To Bukuro*)," by *Nishiki Kage-e Ikeda-Gumi*. This loosely translates into *The Floating Thief at Cherry Blossom Time;* a literal translation is *Cherry Trees, White Waves and a Bean Bag*. However, a person familiar with traditional Japanese kabuki theatre recognizes the cherry tree as a marker for cherry blossom time, white waves as an idiom for a thief and the bean bag as a device that allows for magical things to occur, for example, a character to time travel. [Photo by Mitsue Ikeda, November 7, 2010]

from *"Tousei Suiko-den (Parodic illustrations of Outlaws of the Marsh)"* [8] (1829) by Kuniyoshi also shows a scene where the audience looks up at the screen on which a skeleton and ghostly fires are fighting in front of grave stones while a fukusuke is sitting next to the stones (Okubo 2011: 70-71).

The West invented the perforated film and the projector at the turn of the 20th century. Those devices enabled the projection of continuous movement of still images and gave birth to motion pictures. However, approximately 250 years ago in Japan, motion pictures were born through a totally different conceptual stance with different physical devices.

The visual experience the Japanese magic lantern (furo) offered, and can offer, is different from what Western magic lanterns, phantasmagoria and cinema visual expression provides. The author believes what made a Japanese magic lantern performance unique was an atmosphere that the lantern performers' "*kehai*" (sense of existence) created through their physical expressions.[9] The concept of "kehai" may provide new possibilities for artistic and theatrical expressions today. By detailing traditional techniques the author has created original nishiki kage-e stories and performed them with her students and volunteers (the performance group *Nishiki Kage-e Ikeda-Gumi*).[10] The process of reconstructing devices as well as the engagement with the physical act of performance enabled the author to shed new light on the establishment of nishiki kage-e performance and of its theatrical space in Osaka region.

History of Nishiki Kage-e

The oldest description of a magic lantern in Japan is found in the book titled *"Tengu-tsū* (connoisseur *of Tengu*)"[11] (Maeda ed. 1966: 466-467, Yamamoto 1988: 138-139, Iwamoto 2002: 97-98). The book was published in Osaka in 1779 and describes various magic tricks. It states that a Japanese wooden lantern called *kage-e megane* was sold at an optical shop. According to the book, this kage-e megane was an imitation of a magic lantern imported to Japan by early European traders. The device was used in performances at Nanba-Shinchi, Osaka, and this kage-e megane show became a sensation. Similarly, another book called "*Setsuyou Kikan* (Essays on *Setsuyou* [Osaka area])" (Hamamatsu 1927 [1833]) states that a kage-e megane show titled *"Saisyoku Kagee Oranda Zaiku* (colored shadow play—Holland's *Work)"* was extremely popular in 1790.

Moreover, a previous study (Maeda ed. 1966) on nishiki kage-e refers to a 1796 document, "*Shinpan Tousei Yakusya Ukiyo Geisya Fūryū Mitate Kurabe* (Gracious Illustrations of Current Actors and Floating World *Geisha* Girls, new edition)", that compares a richly-colored *Nagasaki kage-e* (shadow pictures of Nagasaki region) embodying a shadow of a modest-looking girl with a famous *kabuki* performer Kinzo Nakamura's dancing performance in *Dojo-ji*.[12] These records indicate that a prototypical version of a Japanese magic lantern show had been invented in Osaka by the turn of the 19th century. However, the previous study did not recognize this historical significance and identified the establishing point of the show in Tokyo (Edo) region, not in Osaka.

In 1801, this prototypical magic lantern show, *kage-e megane*, was brought to Edo and played at Ueno-Hirokoji under the new name of *Ekiman Kyou* (Eichman Mirror). Kumakichi Kameya (1780-1853), a painter of porcelain and family emblems on *kimonos*, was fascinated by this show and repeatedly attended performances so as to study this kage-e megane. He then devoted himself to creating a new style of magic lantern device and performance. In 1803 he changed his name to Toraku Sansyo-tei and released a paid show titled "*Edo Utsushi-e* (Edo Magic Lantern Show)" at *Kasugai*, a teahouse in Ushigome-Kagurazaka, using a wooden magic lantern. In most historical accounts, this show is considered to mark the establishment of Japanese mag-

ic lantern performance. In the 1830s, a nishiki kage-e performer Tosyo Fujikawa introduced this "*Edo Utsushi -e*" to *Kamigata* (Kyoto and Osaka region) as "*Nishiki Utsushi-e*". The word *nishiki* means "brocade", and by further extension, it is used to mean "rich and vibrant colors". It was the perfect word to describe utsushi-e's richly colored images that stood out in the dark. The vivid contrast of light and shadow also recalled images of "*Kage-e* (shadow pictures)". Eventually, utsushi-e came to be called "*Nishiki no Kage-e* (shadow picture of brocade)", and then "*Nishiki Kage-e* (colorful shadow picture)" by the people of *Kansai*.[13] This name change occurred sometime between 1848 and 1854.[14]

The above mentioned historical perspective on the development of nishiki kage-e is based heavily on the work of Genjiro Kobayashi (Kobayashi 1987), who devoted half his life researching utsushi-e. Kobayashi's work has been highly regarded and widely shared among scholars. However, the basis of his research was on products found in Kanto region and of Edo's utsushi-e. Although Kobayashi mentioned several products in the Kansai area, his discussion was Edo-centered, as he wrote in the introduction of his book:

> *"Honsyo ni oite wa omoni Kantou wo chuushin ni kizyutsu shi, shikamo kagirareta ten ni tsuite syouzyutsusuru youninatta kirai wa manugarenakatta ga..."* (This book mainly focused on Kanto[15] area and it was inevitable to make a fuller discussion only on limited aspects...)" (Kobayashi 1987: v).

This tendency was mainly due to the ambiguity of the origin of surviving materials and arbitrariness of the interpretation of old records. These obscurities have made it difficult to trace a precise picture of nishiki kage -e. For example, almost all existing Japanese magic lanterns and lantern slides for theatrical performances were manufactured in the Meiji period (1868-1912) or altered in accordance with the light sources available in the Meiji period, such as kerosene lamps and then incandescent bulbs. Conventional research methods and the technical inheritance of utsusi-e and nishiki kage-e had to rely on those extant products and operation techniques, which were not fully representing a pristine state of nishiki kage-e when it was called kage-e megane. Other researchers followed the same approach as Kobayashi, and the development of nishiki kage-e has always been placed after the establishment of Edo's utsushi-e.

However, it is doubtful that Toraku's performance marked the beginning of Japanese magic lantern performance. For example, as previously noted, there is the record of the magic lantern show in Osaka in the 1790s, preceding Toraku's magic lantern performance in 1803.

Moreover, in 2010, a nearly complete set of Kamigata (Kansai) style furos and tane-itas modified for home entertainment (hereafter this type of home entertaining furo is called "household" furo) was found in Shikoku Island (Matsumoto 2011).[16] Recently, the author also acquired a physical copy of "*Shinpan Tousei Yakusya Ukiyo Geisya Fūryū Mitate Kurabe* (Gracious Illustrations of Current Actors and Floating World *Geisha* Girls, new edition)," originally published in 1796. The examination of these newly found materials as well as the re-examination of existing historical records suggest that the basic style of story-telling with wooden magic lanterns used in utsusi-e and nishiki kage-e had already been established in the Kamigata area before 1803, which was associated with Toraku's invention of his wooden magic lantern show.

The oldest furo in existence is the "*Kage Ninge* (Shadow Doll)"[17] that has been handed down in the Tsuchishima clan of Ogaki, Matsue City, Shimane prefecture (Fig. 3, hereafter called the "Ogaki-Matsue furo"). Earlier studies (Okuhara 1963, Yamamoto 1975) state that this oldest furo was manufactured in the late Edo period (1840-60's) and had been used for show business until the end of the Taisho period (1912-1926).

Fig. 3. Furo and tane-ita of Ogaki-Matsue furo ("*Kage Ninge*"). [Photo by Mitsue Ikeda, August 23, 2008]

In August 2010, the author photographed Shikoku furo during experiments on a furo's light source using Shikoku furo (Ikeda and Nakagawa 2011). The comparison of the Shikoku furo's and the Matsue-Ogaki furo's photos made the author realize that these two furos have the same shape and thus they are the same type of household furo. Actual measurements of both furos confirmed this analysis. These results suggest that the Ogaki-Matsue furo was originally a household type but later modified to be used for public entertainment. Moreover, based on reports by Okuhara (1963: 25-28) and Yamamoto (1975: 11-12) on a document written by a local historian in Matsue and on existing *joruri*[18] books that were left in the Tsuchishima clan's house, it was probably in the early Bunsei period (1818-1831) when the first owner, Tokubē Tsuchishima, bought three household magic lanterns (furos) and multiple tane-ita sets with play scripts in Kyoto. This suggests that by the time Tokubē Tsuchishima of the Tsuchishima clan first obtained furos, wooden magic lantern performances using multiple furos had already been established in Kansai area.

The Shikoku furo and its tane-ita collection are composed of *shikake tane-itas* (mechanical trick slides) and horizontal and vertical pulling *naga-itas* (long slides). The projected image from a shikake tane-ita changes when a glass slide in the middle (*naka-ita*) is pulled. Each tane-ita slide completes one story. This tane-ita format is specific to the household magic lantern performance style that utilized only one furo (no additional furos were used) and was enjoyed by a small group of people. The structure and format of these tane-itas from Shikoku had already reached technical and artistic perfection. Among them, there is one vertical pulling naga-ita entitled[19] "*Gion Sairei Shinkou Ki* (Book of *Gion* Festival Beliefs" Chapter 4, "*Kinkaku-ji – Tsumasaki Nezumi no Dan* (The Temple of the Golden Pavilion – Toe Mouse"[20] (Matsumoto 2011: 97). According to Sato (2011: 556), this show was premiered in 1757 at *Osaka Toyotake Za* as a *ningyo joruri* (storytelling performance using dolls) and had a long run of three years. A month after the premiere, this show had already been adopted into a kabuki play and became very popular. That this particular scene depicted on the Shikoku tane-ita was one of the most famous scenes in joruri and kabuki indicates that Japanese magic lantern performances were finely tuned into the concurrent entertainment scene.

On the other hand, the Ogaki-Matsue furo set contains three furos, several tane-itas and scripts, all of which were purchased by Tokubē Tsuchishima in Kyoto (Yamamoto 1975: 5, Fig. 4). According to the tane-ita catalog compiled by Keiichi Yamamoto (Yamamoto 1975: 5), the Ogaki-Matsue collection contains various types of tane-itas, such as *naga-e* (long picture), *ichiren -e* (single picture), *niren-e* (double pictures), or *sanren-e* (triple pictures) Some of these tane-itas were intended to be projected with two furos, each of which used naga-ita. This indicates that an intended projection format for the Ogaki-Matsue magic lantern collection was to use several tane-itas and multiple furos to perform a story. Moreover, these were exactly the same size and style as used by nishiki kage-e in Kamigata. The oldest program in the Ogaki-Matsue collection is a complete slide set of "*Keisei Awa no Naruto Zyunrei Uta no Dan* (Collapse of the Castle, Naruto of Awa Prefecture, the Scene of Pilgrimage Songs)" (Sato 2001a: 519, Yamamoto 1975: 7-9). According to Sato (2001a: 519), this joruri was premiered in 1768. Considering how quickly popular joruri and kabuki titles were adopted into the magic lantern shows, the manufacture of Ogaki-Matsue tane-ita depicting this particular show was soon after 1768.

Fig. 4. A set of tools for Japanese magic lantern performance (Ogaki, Matsue's"Kage Ninge"collection): Clockwise from top left, Furos, lenses, Shamisen (Japanese guitar), oil vase (oil for light source), Joruri book (a script), Tane-ita, Wooden clappers, and Screen [Photo by Mitsue Ikeda, August 23, 2008]

Along with joruri books and *hyoshi-gi* (clappers), the Ogaki-Matsue magic lantern set included *syamisen*, an essential musical instrument for joruri performance.[21] Utsushi-e and nishiki kage-e had a distinctive performance style in which multiple furos were used to project a story adopted from joruri and kabuki with music and narration synchronized with the movements of the performers. Musical instruments passed down within the Ogaki-Matsue's Tsuchishima clan suggest that this magic lantern performance style followed the same characteristics as utsushi-e and nishiki kage-e. There is evidence that before Toraku Sansyo-tei and Tosyo Fujikawa came on the scene in Edo at the start of the 19th century, the performance style of Japanese magic lantern as entertainment had already been established in Osaka.

Additionally, the above mentioned document, "*Shinpan Tousei Yakusya Ukiyo Geisya Fūryū Mitate Kurabe* (Gracious Illustrations of Current Actors and Floating World *Geisha* Girls, new edition)" from 1796 matches the richly colored *Nagasaki kage-e* performance with the performances of Kinzo Nakamura (1782-1831). This document is a ranking list of kabuki stars and various entertainers from 1789 to 1796 who were very popular in Osaka. They were divided into East and West with 33 ranking titles mimicking a ranking list of sumo wrestlers (*banzuke-hyo*). Each individual was accompanied with a commentary on their notable play and reputation. The fact that *Nagasaki kage-e* made this ranking suggests that its quality and popularity were comparable to those of other actors and entertainers.

Kinzo Nakamura was a popular kabuki *oyama* (female role) star of the time and in 1803 changed his name to "*Sandai-me Nakamura Noshio* (Noshio III of the Nakamura family)" (Akiba 1979 [1937]: 621). "*Musume Dojo-ji* (Girl of Dojo temple)" was his most successful character. Some researchers argue that this Kinzo Nakamura recorded on the 1796 document was referring to his father, "*Nidai-me nakamura Noshio* (Noshio II of the Nakamura family, 1759-1800)". However such a view does not affect the author's new perspective. Regardless of which Kinzo Nakamura it addresses, the aforementioned praising commentary on *Nagasaki kage-e* suggests that kage-e's "*Musume Dojo-ji"* deserved to use Kinzo Nakamura's name because the projected images could denote the glamour and beauty of his performance with their stunning colors and movements. Since the program "*Musume Dojo-ji*" was very popular, to satisfy the audience who knew the story well and to ensure commercial success, the show would have needed to use multiple furos in unison to effectively depict the story and characters. The author believes that such an operation was possible at that time.

The author has been engaged in the reconstruction of nishiki kage-e and the production of a new play using reconstructed furos and tane-itas. From a producer's perspective, the author conducted several experiments on the light source for the furos in order to pursue two questions (Ikeda and Nakagawa 2011: 127-136). First, how does the projected image actually look on a screen with different types of light sources? Second, what was the actual light quality projected at specific times in the development of nishiki kage-e? Experiments were conducted in August 2010 to answer these two questions. The furo (wooden magic lantern) used in this experiment was reconstructed by the author in 2005. The light sources used for the experiments include: (a) an earthen oil lamp filled with rapeseed oil and wicks[22] (ranging from 1 to 10 wicks) (Fig. 5); (b) Japan wax[23] candles (wicks made of palm rope were added later) (Fig. 6); (c) an antique kerosene lamp; (d) an incandescent bulb; (e) a halogen lamp; (f) a light-emitting diode (LED) lamp; and (g) modern kerosene lamps (3 types, one each made in Japan, Germany, and France). The quality of the projection from these light sources when placed inside of the furo was also compared to the quality of the projection when these sources were used in a metal magic lantern. In the Edo period, (a) and (b) were the main source of lighting, (c) and (d) were used after the Meiji period while (e), (f), and (g) are commonly used now. Results from the experiment found that the rapeseed oil lamp (a) and Japan wax candles (b) were bright enough to view the image projected by the reconstructed furo even when using one wick (**see back cover**).

Fig. 5 (left). An earthen oil lamp filled with rapeseed oil and wicks. [Photo by Mitsue Ikeda, March 17, 2010]

Fig. (right). A Japan wax candle. [Photo by Mitsue Ikeda, September 9, 2010]

Yamamoto (1975) reported that Ogaki-Matsue's furo used six wicks for the light source (Fig. 7). Typically, a 19th century household furo was designed to use only one or two wicks, but in order to use it for public entertainment, it was necessary to increase the amount of light. For the Ogaki-Matsue's household furo, two earthen oil lamps were stacked in pairs. This seems to be evidence of an attempt to fix the light axis that was out of alignment because of the increase in light quantity. Another modification was a hole on the bottom-left corner of the front board. An operator could hook his fingers into the hole to increase stability of the furo during hand operation. Yamamoto (1975) also reported that in addition to three furos, there were two very ancient lenses without the main bodies (furos). The modifications on the original furos as well as multiplicity of the devices indicate that Tokubē Tsuchishima probably knew how to operate multiple furos, and that when he obtained devices in Kyoto, theatrical performance by Japanese magic lantern was already established and

Fig. 7. The inside of Ogaki, Matsue furo ("*Kage Ninge"*) from the back. A light source is placed inside, behind the lens. A tane-ita is placed on the left side leaning toward the furo. [Photo was taken by Mitsue Ikeda, on August 23, 2008]

popular in Kamigata. When he was in Kyoto learning joruri, it is possible that he studied the technical requirements to operate multiple furos.

According to the previous view, a performing art using Japanese magic lantern began to be called nishiki kage-e after Tosyo Fujikawa introduced it as nishiki utsushi-e. However, careful examinations on the previous records and on actual devices from practical perspectives, it is clear that the program and performance style of nishiki kage-e must have been established earlier than previously thought. My newly proposed view is that as soon as the Western magic lantern was introduced to Japan in the early to middle 18th century, its imitation, kage-e megane, began to be sold in Osaka. The intended customers were rich families and this prototypical Japanese magic lantern was sold for household use. Wealthy people bought the lanterns with tane-itas that included scenes from kabuki and joruri that were then popular, single slides with erotic or humorous stories, and pictures of famous places and events. Later, for about 10 years, during the Meiwa period (1764-1772), Japanese magic lantern performances started to recreate popular programs from kabuki and joruri with multiple furos. Utsushi-e and nishiki kage-e's characteristic performance style, in which images were projected with accompanying music and narration, had already been established by that time, as it was necessary to perform stories with kabuki and jyoruri in such a style. Later in 1887, Japan's largest permanent magic lantern theatre, *Ono-seki* (later changed the name to *Ayame-tei*), was built in Kamigata, as nishiki kage-e thrived as commoners' entertainment. Tosyo Fujikawa IV was a master of nishiki kage-e active around this time. However, in the Meiji period (1868-1912), a western magic lantern—the camera—was imported again, and motion pictures (cinema) became popular. The last nishiki kage-e performance reported until recent times was a performance by a comic monologue artist, Nanten Katsura, done in early S*yowa* period (1926-1989). Afterwards, Japanese magic lantern shows basically disappeared. In the *Showa 50*s (1975-1984), one of famous comic monologue artist families, the Beicho Katsura family, started to revive Nanten's nishiki kage-e titles with devices used by him. Nanten's equipment was given to the Beicho family by Toshiharu Utagawa,[25] a nishiki kage-e performer of Kyoto. The Beicho family received guidance from Kenzaburo Yamada,[26] who is a son of Toshiharu Utagawa, and the last nishiki kage-e performer in Kyoto, and continues their nishiki kage-e performances until this day.

Reconstruction and Modification of Furo

The projection style of a Japanese magic lantern is significantly different from that of a Western metal magic lantern, whose body is heavy and has high thermal conductivity. In comparison, the body of a furo is usually made of *kiri* (paulownia wood). Although *sugi* (Japanese cedar[27]) and *hinoki* (Japanese cypress[28]) were occasionally used, kiri was the preferred wood used to construct a furo due to its extremely light specific gravity, which displaces only 0.28 ~ 0.3 g/cm^3. The furo made of kiri is much lighter in weight[29] compared to the one made of other materials and that allows performers to carry and maneuver the furo easily and more freely. Another advantage of using kiri is that it has low thermal conductivity, and it is highly resistance to fire (Takekawa ed. 2005: 1-3). Its ignition point is technically at 425° C (797°F), but when its surface is burnt a charred layer easily develops. The layer serves as a heat insulator that prevents heat from passing through to the core. (Takekawa ed. 2005: 1-3). Furthermore, checking and shrinkage due to drying is negligible (Takekawa ed. 2005: 1-3). Finally, its moisture absorbency, a general characteristic of wood, is low, resulting in minimal warping (Takekawa ed. 2005: 1-3).

These properties of kiri keep a magic lantern's alignment straight. Botanically speaking, kiri is a deciduous tree of the gerardia (*Scrophulariaceae*) family (Yamazaki 1999 [1989]: 221). Unlike other woods, kiri's cellular tissue contains an abundance of parenchyma cells that make up the non-woody structure and its vascular system is gathered up like straws (Takekawa ed. 2005: 1-3). When it is utilized as lumber, air is trapped inside the wood cells and develops the attributes specific to kiri, such as being light weight, heat-stable, limber and elastic (Takekawa ed. 2005: 1-3). In fact, in the light source experiment with a reconstructed furo made of kiri, some parts of the body where the candle flame touched turned black with soot, but the main body was not charred or burnt at all (Ikeda and Nakagawa 2011).

From ancient times in Japan onward, it has been well-known that lixivium leaches out of kiri, which contains tannin, paulownin and sesamin, and results in its efficacy as an insect repellent and resistance against mildew (Takekawa ed. 2005: 1-3). Thus, kiri has been used in various ways, including as the interior walls of warehouses, a material for boxes and dressers that store valuables, musical instruments such as *biwa* (Japanese lute) and *koto* (Japanese harp), and for everyday items such as rice bins and wooden clogs (Takekawa ed. 2005: 1-3). Furthermore, its bark was used as a dye, its leaves were used as a bug repellant, and its wood chips are still burnt and used for charcoal hand-warmers (Takekawa ed. 2005: 1-3). The general wood culture of Japan and detailed knowledge about kiri at the time contributed to the development of the Japanese magic lantern.

The first model of a furo built by the author and used by *Ikeda-Gumi*, hereafter called the "Ikeda-Gumi furo" (Fig. 8), was based on the furo used by Tosiharu Utagawa, a nishiki kage-e performer from Kyoto. This kiri-made furo was used for public performances in the Meijii period and now is in the possession of the Osaka Museum of History (Hereafter called the "Rekihaku[30] furo"). The museum holds the largest collection of tane-itas in Japan including tane-itas used by Tosyo Fujikawa IV[31] and along with the Rekihaku furo, they have been registered as an Osaka Prefecture cultural treasure.

A description of the Rekihaku furo follows. Although the current inserted light source is an incandescent bulb, it seems that a kerosene lamp was originally used. A lamp chimney probably protruded through a hole that remains in the top. When small slides where used a wooden adapter called *naka-waku* (interior frame) was inserted thorough a slide insertions slot and the adapter was pulled out when a wider slide was used. The furo is fitted with a condenser lens 80mm in diameter. Between the lens and the furo, a focus ring[32] is mounted to widen the focal distance. In front of the focus ring, a black shutter cloth is attached, which is characteristic of Japanese

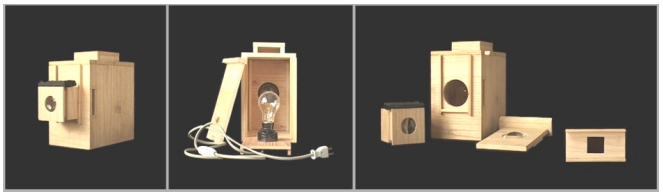

Fig. 8. The first model of Ikeda-Gumi furo, built in 2004. Left: The front of the furo. Center: the back of the furo wtih a back lid and a corded incandescent bulb. Right (from left to right): a focus lens part/ the furo/ a condenser lens part/ a *naka-waku* (interior frame) [Photo was taken by Mitsue Ikeda, on January 11, 2005]

magic lanterns of the Meiji period. There are two lenses 50mm in diameter, one of which is detachable

The Ikeda-Gumi furo has experienced many modifications and improvements up through the current model (Fig. 9). Its general structure adopts the same shutter cloth and interior frame structures as the Rekihaku furo. Both furos have the same inside measurements for the width and the height. However, the length of the Ikeda-Gumi furo was longer so as to accept an acquired lens that has a longer focal length than what was used in the Rekihaku furo. The hole in the top of the Rekihaku furo was reconstructed as a ventilation hole to release the heat generated from the light source, and in order to minimize light escaping through the hole, a special hatch was designed and attached. The size of the furos vary by the sizes of the condenser lenses, which should be a size that does not blur the rims of the tane-ita pictures, while at the same time creating sufficient brightness. The size of a furo also must be limited in order to be with one's hands. All magic lanterns used in a show are supposed to use lenses with the same specification. However, until recently, lenses used by *Ikeda-Gumi* were irregular in size. Moreover, the board that the lenses are inserted into sits right next to the tane-ita so that the distance between a lens and the picture is shorter than older models. This modification heightens color definition.

The earlier models of the Ikeda-Gumi furo adopted a 50 mm lens used by the Rekihaku furo. However, because the rim around the picture frequently blurred with this lens size, the Ikeda-Gumi furo's lens size was switched to a spherical lens 80 mm in diameter. The thickness of the focus ring was determined by the focal distance of the condenser lens as well as by the thickness of the front board and the tane-ita slide. However this base thickness can be adjustable by moving the focus ring back and forth. This flexibility is necessary because the thickness of wood slightly changes based on seasonal change in humidity. In

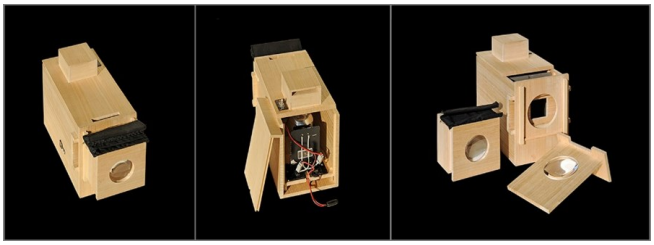

Fig. 9. The current Ikeda-Gumi furo built in 2011. Left: The front and the top of the furo, Center: the back of the furo with a back lid and a portable battery. Right (from left to right): a focus lens part, the furo, a condenser lens part. [Photo was taken by Mitsue Ikeda, on December 13, 2011]

addition, tane-itas made for different programs or manufactured in a different time also require the adjustment in the position of the focus ring.

In addition to standard *yoko-biki tane-ita* (horizontal pulling slides) and *tate-biki tane-ita* (vertical pulling slides), Ikeda-Gumi furo can use a narrow tane-ita slide by opening the slide insertions slot, adjusting it to the wide specification, and inserting a *naka-waku* (adapter) into the furo. Utilizing several adapters with different internal diameters, Ikeda-Gumi furo can perform various types of programs, even those from the Edo and the Meiji periods. For example, in 2012, the author created an adapter based on her previous research (Osaka University of Arts, Art Research Laboratory, ed. 2004). The adapter was tested and verified to be used with a set of tane-itas called "*Douke Shishi Gai* (The Fool's shopping for Boar Meat)" from Meiji period. In 2014, the same adaptor was used to perform "*Ikeda no Shishi Gai* (Shopping for Boar Meat at Ikeda[33])," a reconstructed version of "*Douke Shishi Kai*."

Almost all light sources used for existing Japanese magic lanterns in the Meiji period were either kerosene lamps or incandescent bulbs. As seen in the example of the Rekihaku furo, some modifications were added to the magic lanterns that were originally designed to use a kerosene lamp in order to accommodate the utilization of an incandescent bulb, which was introduced to Japan after 1897. It is generally believed that the kerosene lamp was introduced to Japan around 1860. Because a kerosene lamp was more than 10 times brighter than a rapeseed oil lamp and the price of kerosene was half of rapeseed oil at the time, it rapidly became popular among average households. That probably influenced the change of the light source from rapeseed oil lamps to kerosene lamps.

Based on its structure, it is clear that the original light source for the Rekihaku furo was a kerosene lamp. Some background pictures from a Tosyo Fujikawa's program, "*Ikeda no Shishi Kai* (Shopping for Boar Meat at Ikeda)," depicted seasonal features characteristic of its time, such as the *Shinsai-bashi*, an iron bridge built in 1873, and a police station located at the south end of the bridge (Kato 1979: 124-125). From these pictures the Rekihaku furo's approximate construction date can be estimated to around 1886, before the introduction of an incandescent bulb, when the use of a kerosene lamp is most probable for a magic lantern of this period.

The projection order of four *koma-e* (background illustration) slides also indicates the usage of a kerosene lamp as the light source. Clearly, with a certain combination and arrangement of tane-ita and koma-e, only two furos are necessary to perform the show. However, the combination and arrangement of these existing slides actually requires four furos. The reason four furos were necessary is due to the time it took for the lantern performers to clean the soot from the kerosene's wick as well as to adjust the length of the wick while they were projecting the pictures.

From approximately 1897, incandescent bulbs, which were incomparably brighter and more stable than kerosene lamps, were sold as domestic products. The screen size of *Ono-seki*, a permanent nishiki kage-e theatre that started on the grounds of *Goryo Zinzya* (Goryo shrine) in Osaka, 1897, was said to be 1.5 *ken* (2.73m/8.94ft) high and 3 *ken* (5.45m/17.9ft) wide. The size of the screen was not unrelated to the popularization of incandescent bulbs. The Rekihaku furo was probably used in this theater with the light source modification from a kerosene lamp to an incandescent bulb done around this time.

Compared to candles and rapeseed oil lamps, the incandescent bulb is less reddish, brighter, and excellent in color rendering properties. Thus, it has been actively used as the light source for furos. However, with the current call for the reduction of CO_2 emissions to prevent global warming, the continued availability of incandescent bulbs has been put in doubt. The luminescence system of incandescent bulbs, which incandesces a filament, turns most consumed power into heat, so the exterior of the glass bulb becomes very hot. Moreover, it has poor luminescent efficiency and has a shorter life span compared to fluorescent bulbs and light-emitting diodes (LED). Although this will create a difficult situation for nishiki kage-e production, adopting different types of light sources has been a necessary process for the development of nishiki kage-e over the centuries, so seeking new light sources and modifying furos accordingly is bound to continue.

A performance that uses multiple furos requires many movements with multilayered spatial expressions, and a power cord distracts performers' furo operation and makes their movements cumbersome and complicated. To resolve these problems may provide the discovery of new artistic and theatrical expressions. Back in the old days, the main body of a furo was integrated with the light source. Converting the light source to a wireless system will be the closest way to emulate the performance style before the introduction of electric illumination. From the results of trial-and-error experiments (Ikeda and Nakagawa 2011: 127-136), a 35-watt halogen lamp mimics the color and brightness of an incandescent bulb and was employed as a current light source. The electricity supply system was modified to allow a small electric battery to be carried on a performer's back. Consequently, the physical freedom of performers, as well as safety of movement, were both improved so that performers could significantly focus more on the operation of the furos. However, if a heat-generative bulb is used for the furo's light source, the problem of heat generation still remains. Currently, it has been accommodated by devising a ventilator and inserting a heat sink.

The Tricks and Expression of Tane-ita

Undoubtedly, delicate workmanship was required to construct and create tane-itas. A tane-ita, like a furo, is made with kiri. Its basic structure is composed of *soto-waku* (an outer frame) and *naga-e* (a long picture). Soto-waku is a board of 4~6 mm (0.15~0.23 in) thick with a crosspiece on both sides, into which a thin, painted piece of glass 0.2~0.5 mm (0.007~0.019 in) thick is inserted. After the Meiji period, the thickness of the painted glass increased to approximately 1.3 mm (0.05 in). When there are many independent pictures, the outer frame is slid horizontally to show the pictures in sequence.

Panoramic pictures depicting background and processions are called *naga-e* (long picture). There are two types of tane-ita slides that *naga-e* scenes were painted. One is called *yoko-biki* (horizontal pulling) and the other is called *tate-biki* (vertical pulling). Both are slowly pulled to sequentially show the scenes. An insertion slot could be opened on the top of the furo so as to insert a vertical pulling *naga-e*. A horizontal pulling *naga-e* uses the regular tane-ita inserting slot on the side.

There are some tane-itas that include visual tricks/illusions. A glass plate with a part of a picture that changes or moves, is inserted into the *naka-ita* (middle board) of this trick tane-ita. Bamboo nails driven in an outer frame slide in grooves cut into the middle board (naka-ita). The sliding distance is the same as the nails' length. This trick enables one to change the whole picture or a part of overlapping pictures and gives the illusion of transformation. When this unit is made, the outer frame and the glass on the middle board should not touch each other, yet both boards should nestle close against each other and move together. Also, they should move smoothly when they are inserted into the slot. Although the dimension of the slot varied in furos, usually the length was approximately 9 x 63 mm (0.35 x 2.48 in) in Kamigata and 13 x 75 mm (0.51 x 2.95 in) in Edo. Thus, while the total thickness of these boards should be smaller than the insertion slot's width, strict tolerances need to be maintained. If there is too wide a gap between the tane-itas and the insertion slot, light will leak through the crevices.

Some of the remaining old tane-itas have a triplex structural trick with a doubled middle board, but its thickness stays within the range of the slot's width. There were also some tane-itas that can rotate a picture or that combine glass painting and Japanese paper to portray falling snow. These mechanical tane-itas were designed to create the illusion of moving pictures.

Although the typical size of glass paintings on the outer frame was approximately 40 mm square (1.575 in) in Kamigata and 50 mm square (1.969 in) in Edo, some were rendered in different shapes and sizes according to the painted pictures and the dimensions of the glass plates. Some old tane-itas, such as those used in household magic lanterns, had a round glass plate of 40 mm (1.575 in) in diameter. Based on the quality of the light sources and of the lenses available 100~200 years ago, the rim of the projected picture would blur. This infers that the glass plate was not necessary to be an exact square and a round pane was sufficient. Moreover, a round pane uses less glass, which was very expensive a century ago. Regardless, glass craftsmen at the time had high level techniques that allowed for the manufacture of uniformly thin flat glass. Restored tane-itas for "*Ikeda no Shishi Kai* (Shopping for Boar Meat at Ikeda)" used glass plates about 1 mm (0.03 in) thick and most of its trick parts fit into one frame. The average length of the glass used on the middle board was the sum of two frames with identical pictures and one frame with a trick part (Fig. 10). As noted above, background pictures suggested that these tane-itas were manufactured around 1886 (Meiji 20), when the production and distribution of glass plates became more stable compare to the Edo period. A reliable supply enabled such a munificent use of glass.

Fig. 10. Trick tane-itas for "*Doke Shishi Kai*", restored in 2013. [Photo by Mitsue Ikeda, on February 01, 2015]

The picture projected by a Japanese magic lantern is a colorful shadow looming out of the darkness. In an effort to improve its effect, the area around the picture was masked with *sumi* (ink stick). A fine line, such as an outline of the picture, was drawn by scratching ink with a needle. In order to adhere the ink onto the glass, hide glue was mixed into the ink. Up to date dyeing knowledge and techniques utilized in ceramics and kimono production were utilized to color the glass. For vivid coloring, a catalyzed reaction of light-transmissive dyes was used to produce the color and fix it onto the glass. Well-known catalytic substances included peach resin, egg white, dried alum, and gum Arabic. The colors mainly used for tane-ita pictures were red, yellow, purple, and indigo in Edo; and vermilion, scarlet, sky blue, yellow, and yellowish-red in Kamigata. Because the light source's reddish color affected color expression of blue pigment, green was thought to be unsuitable and unnecessary to be included in the color palette. However, tane-itas accompanied with Shikoku furo contain green and gray. Skin color was almost always rendered unpigmented and thus reflected the light sources' original color. Because the color temperature of rapeseed oil lamps and kerosene lamps is approximately 1670 – 2040 kelvin, their light appears reddish-orange (Ikeda and Nakagawa 2011: 130-132; **see back cover**). To Japanese eyes, this reddish orange skin color projected on the screen would not be too distinctively bright and seem very natural.

The magic lantern performance group, "*Nishiki Kage-e Ikeda-Gumi*" uses kiri for the main slide body and paint on panes of acrylic for the tane-ita pictures instead of breakable glass. In order to avoid heat deformation by the light source, a 2 mm (0.078 in) acrylic sheet is used as the base. Lith film for monochrome printing and photographing is used for pictures. The film is colored by dye-based inks, and then it is pasted onto the acrylic sheet. The dark space surrounding the pictures used to be blacked out with sumi ink. The current version utilizes the original black background of the lith film. Through the production of original plays, the group tries to reconstruct the mechanical tricks of the Japanese magic lantern, as well as to expand the possibilities of tricks to project different types of expressions. In addition to variations of basic yoko-biki (horizontal pulling) tane-ita, the group has made various types of tane-itas such as double-pulling, vertical pulling, swiveling and those combined with Japanese paper and cotton string.

The author has continually been studying and devising mechanical gimmicks of tane-itas. For example, in the Meiji period, chromatrope, which was called *karin-sya* (flower hoop wheel, Fig. 11), was shown separately after a program. Because of its popularity, *Ikeda-Gumi* has created three different types of chromatrope tane-itas that were shown as a separate program at the end of a performance. Another gimmick is a set of double-pulling tane-itas with an illustration of a man. When one of tane-itas is pulled, the length of his body changes like an accordion. Another gimmick moves a slide as if the wind is blowing when it is pulled vertically, while if pulled horizontally, it appears as if it is raining. One of the most popular gimmicks is a tane-ita with a roll of Japanese paper mounted in the slide. The paper has multiple holes in various shapes that are as little as 1 mm (0.03 inch) in size. When an operator rewinds the paper, the projected images and their movements can represent a flurry of cherry blossoms petals, fireflies, or snowflakes. These are examples of the author's efforts to utilize the movement of the slides and gimmicks to create various kinetic movements. However, I believe that when we incorporate visual effects created through the combination of the outer frame and the picture on the middle board, we can expand the potential of dynamic expressions of the Japanese magic lantern (Fig. 12).

Fig. 11. "Karinsha (a Sketch of Nishiki Kage-e)" [Photo by Mitsue Ikeda on December 24, 2017]

Fig. 12. Members of "Nishiki Kage-e Ikeda-Gumi" practicing , multiple furos are utilized to rear project images onto the screen. [Photo by Yoshinori Matsuo, November 1, 2011]

Narrative Space of Nishiki Kage-e

The most popular themes for a household magic lantern's tane-itas were erotic and humorous stories, famous sightseeing places, seasonal events and scenes from kabuki and joruri popular at the time. While following these conventions, box-office magic lantern shows added narration by *fukusuke* (traditional doll) and congratulatory *san-ban so*, a type of traditional celebratory dance offered at the beginning of the show. They also adopted stories and themes from kabuki and joruri plays, from various types of storytelling such as *kodan* and *sekkyou bushi*, *gun-ki* (military epics), *bukkyo setsuwa* (Buddhism related folktales), and *rakugo* (comic story telling). Particularly popular among those stories and genres was *kaidan* (ghost stories) (Fig. 13).

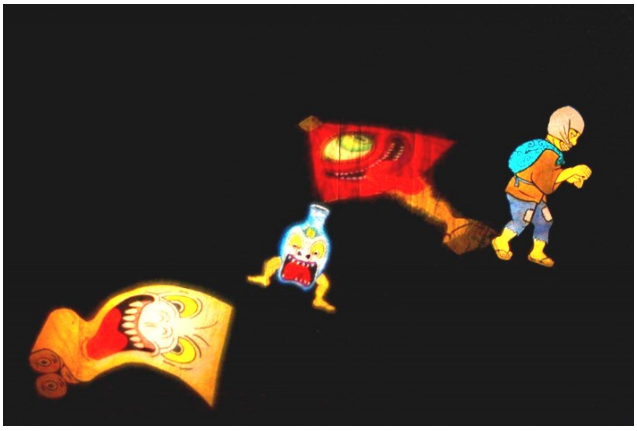

Fig. 13. Example of yokai (supernatural creatures) depicted by a tane-ita slide. From "*Sakura Shiranami Hyoi To Bukuro* (Floating Thief at Cherry Blossom Time)". [Photo by Yoshinori Matsuo, November 7, 2011]

From the end of the Edo period until the time when magic lantern performance was abandoned, utsushi-e and nishiki kage-e actively played at temporary playhouses. However, the main performance style consisted of small touring companies of 3 to 10 people performing at local taverns or at a village headman's garden or home. The show was usually held early in the evening; in those days there was very little background light and darkness was complete, the darkness dropping like a shroud. It is the place where *yokai* (supernatural creatures), *bake-mono* (monsters) and *yūrei* (ghosts) lurk and hide, waiting to pounce. The thread line and crinkle of Japanese paper used for the screen would add scabrous texture to the pictures floating in the dark and increase the visual depth of the images. The flow of air softly waved the images of *bake-mono* (monsters) and *yokai* (supernatural creatures) and effectively turned pictorial monsters into dynamic expressions that allowed a ghastly and mysterious world to emerge on the screen. The foundation of the popularity of *kaidan-mono* (ghost stories) is a world whose existence is based on the fusion of a space consciousness defined by darkness and the darkness on the screen and within the theatrical space.

An example of the sophisticated visual effects of Japanese magic lanterns can be found in the tane-ita slides of "*Douke Shishi Kai* (The Fool's Shopping for Boar Meat)," also known as "*Ikeda no Shishi Kai* (Shopping for Boar Meat at Ikeda)." This story is part of the tane-ita collections owned by the Osaka Museum of History and was originally created as a *rakugo* (comic monologue) play. Interestingly, after the tane-ita depicting the original *ochi* (punch line), two extra slides were added to extend the story. One

tane-ita depicts the scene of a three-eyed giant and a fox wearing a *kimono* & *hakama* (Japanese male culottes) with a sword in hand (**see front cover**). Trick slides attached to this tane-ita depict a picture of the fox falling down and then a picture of the fox sprawled on the ground. In these trick slides, the three-eyed giant disappears as the fox appears on the screen. The other tane-ita contains two scenes. One is the hero (introduced earlier) fighting with the fox, the other is the hero walking while carrying the fox he defeated on his shoulder. This scene contains the hero's four main movements: rolling up his sleeves, holding the sword and preparing for the fight, striking the fox, and hanging the fox on a bar and carrying it. These new scenes were original to the nishiki kage-e and introduced unexpected plot twists to audience who were thoroughly familiar with the original story and would not have been satisfied with a simple retelling of the well-known punch lines. The new characters, the three-eyed giant and the fox, were depicted as supernatural beings, such as *bake-mono* (monsters) and *yokai* (supernatural creatures), which provide the Japanese magic lantern's distinctive visual excitement.

Since an original script has yet to be discovered, details of the story are unknown. However, if the story is performed in accordance with the original rakugo play, only 17 tane-itas are necessary to complete the story. The author has created a new story accompanying with the two additional slides and created a longer version of the play. For the scene with the three-eyed giant, the tremor of the Japanese paper screen and the distortions in the shapes of the characters created by different projection angles enhanced the terror of the monsters.

The fight scene between the fox and the hero offers an active scene with many movements. For the fight scene a quick change of slides and deft operation of the furo are required. Thus, both scenes provide a showcase to highlight the lantern performers' techniques. In the longer version of the story, after the original *rakugo*'s final punch line, the additional nishiki kage-e climax follows and another punch line provides the finale. The excitement and amusement of this longer version of "*Ikeda no Shishi Kai* (Shopping for Boar Meat at Ikeda)" was threefold and would have received great applause from the audiences at the time.

In addition to the Japanese magic lantern`s unique visual cues, the utilization of the space and the constrained spatial representation are important elements of a performance. The shadows of Japanese magic lantern pictures float in the dark. Pitch-black darkness around the pictures is not empty space but "*ba* (field)" in a story. This unspecified field can turn into a building, a room, a garden, woods, a forest, a river or a pond. It might represent an era itself. Even distinctively different spaces such as the afterworld and this world can exist together in the darkness filled with *kehai* (a sign of presence). Such a spatial consciousness peculiar to Japanese at that time acts on the Japanese magic lantern's spatial representation. Therefore, explanatory images are cut out to the utmost extent so that the screen does not brim over with images and fewer furo are needed to describe a story. Such minimalism helps people suspend disbelief and to wholeheartedly jump into the story.

One of *Nishiki Kage-e Ikeda-Gumi*'s original plays, "*Sakura Shiranami Hyoi To Bukuro* (Floating Thief at Cherry Blossom Time)" provides a good example of the characteristics of Japanese magic lantern's spatial representation described above. On one tane-ita slide, a man and a door are shown and the rest of slide is completely blacked out (Fig. 14). The man's movement and his dialogue tell the audience that there is a house behind the door. The tricks attached to this tane-ita have the man open the door and he then disappears into the house. These movements inform that the next scene will take place inside the house.

Fig. 14. The scene of a man approaching a door from "*Sakura Shiranami Hyoi To Bukuro* (Floating Thief at Cherry Blossom Time)." [Photo by Yoshinori Matsuo, November 7, 2010]

The image projected onto the screen of the other tane-ita slide (Fig. 15) may represent the inside of the bean bag, the surface of water on which the moon and the cherry blossoms reflect, or action occurring underwater. Such built-in ambiguity is another defining feature of these performances. Each scene consists of nothing but the main pictures with no extraneous details. Certainly, the void surrounding the images on the screen creates a symbolic space. The performers of utsushi-e and nishiki kage-e have to be aware of the symbolic nature of the screen space. Uti-

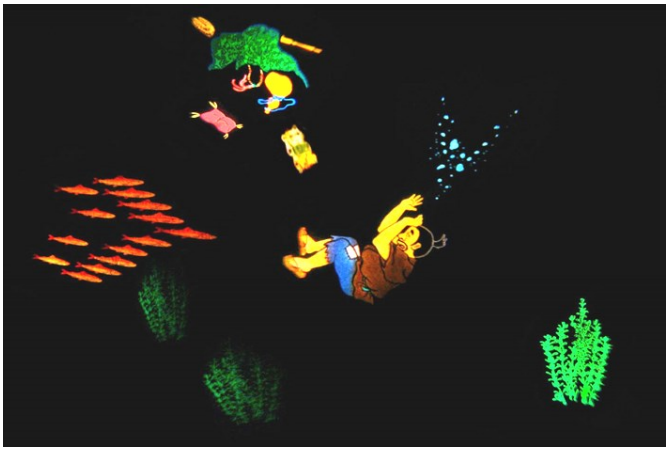

Figure 15. The underwater scene from "*Sakura Shiranami Hyoi To Bukuro* (Floating Thief at lizing every possibility of its symbolic space is a key to portraying the world of the Japanese magic lantern.

lizing every possibility of its symbolic space is a key to portraying the world of the Japanese magic lantern.

The Japanese magic lantern expresses movement and emotion through trick tane-itas and the operation of handheld furos by *gen-to shi* (magic lantern performers). The tane-ita slides' pictorial range is limited, making it difficult to express complex emotions of a story line solely through static visuals. But by carefully operating the furo, slight movements in sync with the narration vividly expresses the emotions of the various characters projected onto the screen. Emotions such as surprise, fear, delight, anger, sorrow and pleasure, as well as physical properties such as the weight of objects, are expressed through the slightest of movements. This cinemagraphic dance was, and continues to be, dependent upon the skill of the performers.

The Ikeda-Gumi furo has improved operability by being freed from power cords allowing the furo to become a part of the performer's body so that careful attention can be given to the delicate movements necessary to fully express the explicit and implicit narratives that lay latent within the tane-ita slides.

Conclusion

Japanese magic lantern performances, utsushi-e and nishiki kage-e, are said to have formed the basis of the unique visual culture of Japan and the starting point was thought to originate with a Japanese wooden magic lantern called "*kage-e megane* (shadow picture glasses)" that was an imitation of a magic lantern imported to Japan by early European traders during the Meiwa period (1764-1772) and was performed at Nanba -Shinchi, Osaka (Iwamoto 2002, Maeda ed. 1966, Yamamoto 1988). Although the author shares the conventional notion of the Japanese lantern's introduction via *kage-e magane*, the actual production and practice of modern-day nishiki kage-e led her to be skeptical of previous views on the establishment of Japanese magic lantern`s performance styles in Kamigata based on developments in Edo. For example, in order for the kage-e megane show, "*Saisyoku Kagee Oranda Zaiku* (Colored Shadow Play – Holland's Work)" to become a big hit in Osaka in 1790, it was necessary to make many innovative changes.

To perform "*Musume Dojo-ji* (Girl of Dojo temple)" as a Japanese magic lantern performance in 1796, several furos (magic lanterns) as well as high-level operational techniques most likely were required. To the author, who has produced and performed this type of theatre, it seems natural that in order to keep the audience in a show tent for a certain amount of time and to keep them satisfied, modifications needed to be made. For example, the magic lantern was most likely at least mobile, and it was also likely that effective built-in mechanical devices with picture switching techniques were developed and practiced along with music. Japanese magic lanterns were the latest visual media at the time and if the best scenes from joruri (traditional Japanese storytelling with music) and kabuki were arranged for the magic lantern, those shows would have a good chance of commercial success at the box office. Because people of Osaka at the time had a tendency to rapidly refine/ adapt new technologies and items, as soon as the Western metal magic lantern was introduced to Japan, they made a wooden version of it and put it on the market. Therefore, the prevailing view that it took more than 40 years for Japanese magic lantern performance to be recognized among people in Osaka seems to be unrealistic.

The author began to question the previous perspective as the result of nishiki kage-e reconstruction and practical examination of its performing styles and innovative changes. For example, a comparison of public performance styles using the Ogaki-Matsue's household furo owned by the Tsuchishima family in Shikoku Island, along with a set of Kamigata style tane-ita, showed equipment and story boards existed in the Kamigata region long before Edo based performance styles developed. In addition, the results of viable light source technology experiments (Ikeda and Nakagawa 2011) suggest that although the Ogaki-Matsue furo was used for public performance with six wicks for the light source (Yamamoto 1975: 7), it was manufactured as a household magic lantern and was designed to use only one or two wicks. Practical verification experiments were conducted that confirm that the popular light source at the time, an earthen

oil lamp filled with rapeseed oil with one wick, can provide enough brightness for a magic lantern performance (Ikeda and Nakagawa 2011: 130-132).

The last clue came from the discovery of one of original woodprints of "*Shinpan Tousei Yakusya Ukiyo Geisya Fūryū Mitate Kisoi* (Gracious Illustrations of Current Actors and Floating World *Geisha* Girls, new edition)". The woodprint the author obtained was manufactured around 1798 and the proof evidence of Japanese magic lantern performance in Kamigata in an earlier era. In this document, the relationship between the artistry of *Nagasaki kage-e* performance and Kinzo Nakamura's kabuki play was inseparable. *Nagasaki kage-e*'s "*Dojo-ji*" program inspired by kabuki connects to Ogaki-Matsue's tane-itas for "*Keisei Awa no Naruto Zyunrei Uta no Dan* (Collapse of the Castle, Naruto of Awa Prefecture, the Scene of Pilgrimage Songs)," another famous play adopted from joruri. These famous stories that were adopted from joruri and kabuki suggest not only that nishiki kage-e tuned into popular entertainment scenes at the time, but also in order to perform them successfully, high-level operational techniques and multiple projectors were required. If such performances were possible, this means that the establishment of Japanese magic lantern shows in Kamigata was much earlier than previously thought.

A local history of Osaka notes that the first Tosyo Fujikawa held a magic lantern show at Nanba-Shinchi in 1790 and that his family had lived in near-by Kita Horie for generations. The mastery of Japanese magic lantern was handed down from the first to the second Tosyo Fujikawa (Kamigata Kyodo Kenkyukai 1931: 80). As a son of Tosyo Fujikawa III, Tosyo Fujikawa IV developed familiarity with nishiki kage-e from a young age. As the last traditional nishiki kage-e performer, he lived more than 40 years with nishiki kage-e. Since "*Saisyoku Kagee Oranda Zaiku* (colored shadow play—Holland's Work)" at Nanba-Shinchi via *Nagasaki Kage-e*, nishiki kage-e has presented the programs responding to audiences needs and interests. During the 1790's, when Etienne Robertson was performing his elaborate mechanical magic lantern show "Phantasmagoria" in Europe, a totally unique magic lantern culture that relies on the expressive ability of the lantern performer was being established in Kamigata and its tradition and mastery was succeeded through generations.

The fascination of Japanese magic lantern performance is largely a result of the integration of traditional Japanese techniques of wood craft, papermaking, and dyeing with spatial consciousness peculiar to the Japanese. For example, Japanese magic lantern's screen space represents "darkness," not as "*mu* (nothing)," but as a symbolic space filled with "*kehai* (a sign of presence of things)." A unique Japanese space consciousness sees this subtle sign of presence as "*u* (status of being)" and enables the construction of a multi-layered narrative space on the screen. In addition to the *kehai* expressed by the darkness of the screen, it can also be represented by a lantern performer whose "*kehai* (sense of existence)" is created through his or her physical expressions. This intimate connection between a performer's physical movements and the projected images enabled audiences to become immersed in a story. Simultaneously, the performer can sense audiences' subtle movements and voices responding to the performance on the other side of the screen. Once the performer felt this *kehai* of the audience, it would be reflected in their performance, regardless of their awareness. This permeable space between the performer and the audiences is the performing space of nishiki kage-e, in which its unique "*ba* (field)" comes into existence. Being aware of "ba" in nishiki kage-e's performing space and consciously reflecting it in its theatrical expressions and performance will expand the artistic possibility of nishiki kage-e.

Acknowledgements

I would like to express my respect for the former researchers who engaged in the study of Japanese magic lanterns. Current "*Nishiki Kage-e Ikeda-Gumi*" would not exist without their work. I also would like to express my sincere gratitude to the following people: The successive members of "*Nishiki Kage-e Ikeda-Gumi*" who have performed the shows with the author. My colleagues from Osaka University of Arts, Nobuaki Nakagawa, Tadao Iwakura and Kokichi Fujimoto, who helped me a lot on improving operations of the furo and the experiments on the light sources. Fumio Yamagata and Yūko Tanaka of "*Minwa-za,*" who have given the author advice since she began engaging in the furo reconstruction. I would also like to thank my colleague, Prof. J. Thomas Perry (Osaka University of Art) for his proof reading and editorial comments on the English translation. And finally, I owe an incalculable debt to my daughter, Dr. Yuki Tanaka-McFarlane (Saint Louis University), for translating this paper into English.

Notes

1. The name *Nishiki Kage-e* was used in Western Japan. In *Edo* (Tokyo), it was called *Utsushi-e*.

2. Japanese use the Japanese era name (元号 *gengō* 'year name'), a calendar scheme unique to Japan in addition to Gregorian calendar dates. Although the original Japanese paper refers to *gengō*, for example, the year 1829 was written with the corresponding *gengō*, 文政12年 'year of *Bunsei* 12', this English version will omit exact reference to the *gengō* unless it is relevant to the context in attempt to reduce confusion among readers who are unfamiliar

the system.

3. Scientific name is *Paulownia tomentosa*.

4. This particular model, *Nishiki Kage-e Ikeda-Gumi Furo,* was made by Mitsue Ikeda on July 2011. *Gumi* means 'group.'

5. *Uchiwa-e* is a type of *ukiyo-e*, a genre of Japanese woodblock prints and paintings in the Edo period, printed on a fan shaped paper.

6. A *Daruma* (or *Dharma*) doll is a hollow, round Japanese traditional doll modeled after *Bodhidharma*, the founder of the *Zen* school of Buddhism. It is usually depicted without hands and legs.

7. A *Fukusuke* doll is a traditional china doll associated with good luck in Japan. It is characterized by a big head and *chonmage* (a form of Japanese traditional haircut with a topknot worn by *samurai* (Japanese warier) and *sumo* wrestlers.

8. *Suiko-den* is a Japanese translation of a Chinese novel, *Shui Hu Zhuan*. It is considered to be one of the Four Great Classical Novels of Chinese literature.

9. *Kehai,* 気配, has various translations and is typically used to express an underlying sense, an underlying atmosphere, a hint or implicit meaning. It can also be defined as a physical gesture.

10. Please visit the group's website (http://nishiki-kagee.com/) for more information.

11. *Tengu* is a type of god or supernatural being (*Yokai*).

12. *Dojo-ji* is a famous *Noh* play (classical Japanese musical drama) and a popular adaptation for *kabuki* theatre.

13. Western Japan, including Kyoto and Osaka.

14. In the early Meiji period (1868-1878), it was also called *Nishiki Ayatsuri* (puppeteering brocade).

15. Eastern Japan, including Tokyo (Edo).

16. One of the four main islands of Japan consisting of Ehime, Kagawa, Kochi, and Tokushima prefectures.

17. A local name for utsushi-e and nishiki kage-e.

18. *Joruri* is a type of traditional Japanese storytelling with a musical narrative.

`9. In Matsumoto (2011), it was labeled tane-ita number 20 and was tentatively titled "*Roukaku to Taki* (Pavilion and Waterfall)."

20. *Tsumasaki Nezumi* in this popular kabuki play, 'Toe Mouse' refers to a mouse that is drawn by the toe of a princess (Toe Mouse) after being hog tied, the picture then becomes a real mouse and it gnaws the rope to untie her.

21. A traditional Japanese musical instrument with three strings and played with a plectrum called a *bachi*.

22. These wicks were made of *igusa* (soft rush, scientific name: *Juncus effuses*), the same material used in tatami mats. A traditional technique called *toushin biki* (pulling a wick) was used to pull a pith out of a stalk.

23. Japan wax is also known as sumac wax and as Japanese tallow. It is the main ingredient for Japanese candles. The wax is a type of sumac and is obtained from the fruits of *hazenoki* (Japanese wax tree, scientific name: *Toxicodendron succedaneum*). It is very sticky and has a pale-green color. A number of coats of wax are applied onto the wick made of a wooden or bamboo stick wrapped with Japanese paper and floss silk. Therefore, the resulting candle`s cross-sectional surface looks like the annual growth rings of a tree.

24. 1889-1972. His real name was Shigeharu Takenaka.

25. 1877-1961. His real name was Kenzo Yamada.

26. 1916-1998.

27. Scientific name is *Cryptomeria japonica*.

28. Scientific name is *Chamaecyparis obtuse*.

29. 1 g is approximately 0.03 oz./ 1 oz. is approximately 28 g.

30. This title is based on the museum's Japanese name, *Osaka Rekishi Hakubutsu Kan* as well as its popular abbreviated name, *Reki-Haku*.

31. The tane-itas used by Tosyo Fujikawa IV were previously owned by Goro Soganoya, and then donated by Takanoshin Omori to the Osaka Museum of History.

32. It is known as "helicoids" among Japanese photographers.

33. A city located in Osaka prefecture, no relation to the author.

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New Ph.D. Dissertation

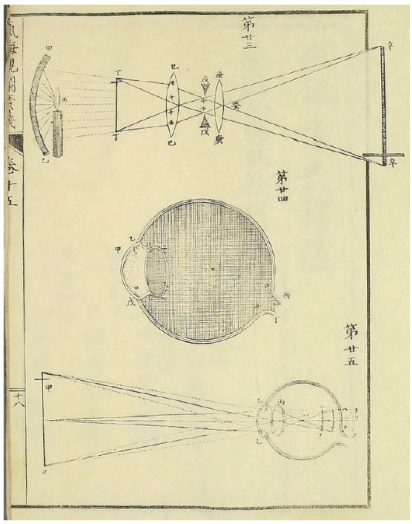
Lewis Bremner. 2019. *The magic lantern in Japan : transnational technology across the long nineteenth century*. University of Oxford.

Abstract: This thesis presents a history of the magic lantern in Japan from the late eighteenth to the early twentieth century. From the first recorded appearance of the magic lantern in the 1770s, Japanese intellectual figures such as Ōtsuki Gentaku were fascinated by the device and positioned it within a wider discourse on epistemology, knowledge about nature, and the study of the human body. This helped to lay the groundwork for the emergence of localised groups of domestic magic lantern producers in the early nineteenth century, which supported, in turn, the unprecedented country-wide popularity of magic lantern shows in the latter half of the 1800s and early 1900s. With different versions of the device in production and circulation, the technology found use in the hands of a variety of state and non-state historical actors, linking it to both broad societal changes and the everyday lives of Japanese people in this period. This work, the first detailed study of the topic in English, traces not only the development of the magic lantern as a physical instrument in Japan, but also the expanding web of intellectual, social, economic, cultural, and political developments that hinged on or were otherwise profoundly shaped by connections to this unique technology. As well as elucidating the significance of the magic lantern beyond the spheres of visual culture and pre-cinema history, the thesis uses the device to tell a story from beyond the prevailing narratives of global technological and intellectual development. By analysing the ways that this single technology was imported, ascribed meaning, manufactured, and used over a significant timeframe - the "long" nineteenth century - it is possible to consider Japanese history outside of the conventional divide of "early modern" Tokugawa Japan and "modern" Meiji Japan. This new technological history decentres the influence of the West and the state, revealing instead the far-reaching importance of transnational, often non-state connections and networks to major trends in areas such as technological and cultural production, epistemology, humanitarianism, and political discourse.

The Research Page presents summaries of recent academic research on topics related to the magic lantern. For a comprehensive bibliography of research articles, see: https://www.zotero.org/groups magic_lantern_research_group

Lewis Bremner. 2019. The magic lantern as a lens for observing the eye in Tokugawa Japan: technology, translation, and the *Rangaku* movement. *Modern Asian Studies*, 39 pp. DOI: 10.1017/S0026749X19000143

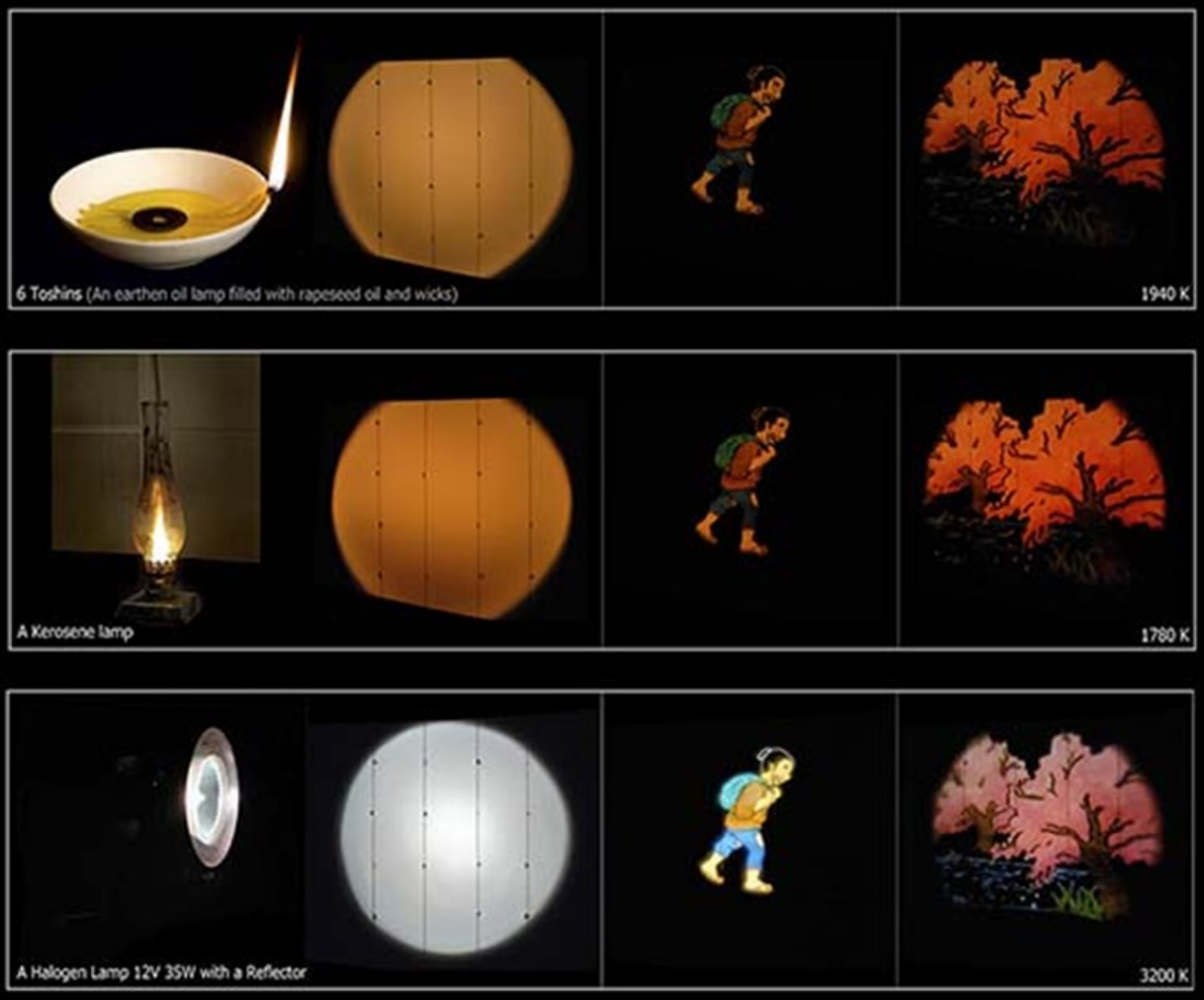
This article, derived from the Ph.D. dissertation mentioned on the previous page, examines the magic lantern in Japan from a very different perspective from that of Mitsue Ikeda's article. The author focuses on the cultural impact of the magic lantern rather than technical details of its construction and public display. In particular he argues that understanding of how the magic lantern works became a key element in understanding the structure and function of the human eye in the period from the 1770s to the 1820s. The magic lantern was introduced into Japan by Dutch traders in the 18th century. The author links early interest in the magic lantern to writings of the *Rangaku* (Dutch Studies) movement, a major avenue for introducing western empirical methods into Japanese science and medicine. After a short overview of the early history of the magic lantern in Japan, the author devotes much of the article to Japanese ophthalmology and the problems of making direct observations on the workings of the eye. The more easily understood optics of the magic lantern thus became a means for understanding optics of the eye.



Japanese illustration (1851) comparing the optics of the magic lantern (top) with the optics of the human eye.

Lynne Kent. 2019. Conjuring unseen forces: rainmaking in Australia with John Henry Pepper. *Journal of Science and Popular Culture* 2:143-154.

This article describes a somewhat bizarre episode in the life of scientific showman John Henry Pepper. Best known for his magic lantern spectacles and ghost shows in London, Prof. Pepper aimed to provide both entertainment and instruction to his audiences. For example, he produced his famous ghost effects during stage plays, but he also lectured and published on the mirror trickery used to produce the ghost effect. In 1882, during a multi-year tour of Australia, Pepper was in Queensland during an extended drought. He decided to do a public exhibition of methods he claimed would produce much-needed rain. These methods involved the use of aerial explosives and were not based on any actual scientific theory. In hindsight, it seems obvious that launching explosive shells and rockets into the air would be more likely to produce a bush fire than a rainstorm, and in fact, Peper's experiments were an abject failure, resulting in rockets flying off in various directions. The author places Pepper's rainmaking efforts in the broader context of late Victorian enthusiasm for "scientific" spectacles.


6 Toshins (An earthen oil lamp filled with rapeseed oil and wicks)
1940 K
A Kerosene lamp
1780 K
A Halogen Lamp 12V 35W with a Reflector
3200 K

Above: The result of light source experiment using a wooden Japanese magic lantern. From top to bottom: 1) An earthen oil lamp filled with rapeseed oil and wicks; 2) A kerosene lamp; 3) A Halogen lamp 12V 35W with a reflector [experiment and photos by Mitsue Ikeda]. Only the bright modern source produces a realistic color for the cherry trees (right), but 19th century audiences would have experienced a more dimly lit image.

F**ront cover:** *Mitsume Nyudo* (three-eyed giant) and *Bakemono Kitsune* (a fox goblin) from the magic lantern story "*Doke Shishi Kai*" [Photo by Mitsue Ikeda].